

Records, Results, Reporting, and Reviews

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Records, Results, Reporting, and Reviews

1 PURPOSE

This document establishes the procedures for records, conclusions rendered, reporting methods, verifications, and reviews that are specific to the Firearms/Toolmarks Discipline (FTD) of the FBI Laboratory. The FTD is composed of personnel from the Firearms/Toolmarks Unit (FTU) and the Scientific & Biometrics Analysis Unit – Toolmark Group (SBAU-TG).

2 SCOPE

This procedure is utilized by authorized personnel who handle evidence, perform classifications and comparisons, render source conclusions, complete verifications, and/or issue results in the FTD.

3 FBI LABORATORY FILE RECORDS

3.1 Case Notes

- A. When applicable, examinations performed will be recorded on the appropriate FTD Worksheet and will include the relevant description of the class and microscopic characteristics of the evidentiary item being examined.
 - 1. The data fields on an FTD Worksheet represent the minimum amount of information required for examination records. For data fields not relevant to an examination, “not applicable” (or its derivative) will be entered into the field.
- B. All examination records will contain either a comprehensive page numbering system or a separate listing of all elements of the examination records.
- C. Examination records that pertain to questioned items of evidence shall be completed in order to document characteristics suitable for comparison prior to the actual comparison to a known item of evidence, to exemplars from a known item of evidence, or to another unknown item of evidence.
- D. Records not captured on an FTD Worksheet will meet the requirements in section 2.10.B of the [Operations Manual](#).
- E. For electronic examination records, the examiner’s initials and the initials of the person preparing the examination record will be tracked using password protected electronic access (e.g., NIBIN records, General Rifling Characteristic File, Reference Firearms Collection, CADRE). Password protected systems (e.g., NIBIN, BuNet, LabNet, UNet) allow for initials or signature, which are secure electronic equivalent.

3.2 Photography

- A. When a source identification or fracture fit (through either microscopic comparison or physical fit evaluation) conclusion is reached, a photograph and/or image will be taken to illustrate and record the area(s) that supports the Examiner’s conclusion.
 - 1. A photograph and/or image produced through light comparison microscopy (LCM) and/or virtual comparison microscopy (VCM) that illustrates an

Examiner's comparison conclusion will be included in the [FTD Results Worksheet](#).

2. When a photograph and/or image cannot be captured, the examiner will include a detailed description of the location and marks that support the conclusion. This description will be included in the [FTD Results Worksheet](#).
 3. If an item is too large for LCM photography, a photograph using a DSLR or equivalent camera may be used for the documentation.
- B. Photographic documentation of comparisons that result in inconclusive or source exclusions are optional and at the discretion of the Examiner.

3.3 NIBIN Database Records

The National Integrated Ballistics Information Network (NIBIN) acquisition and correlation records are considered part of the case record. The NIBIN system is maintained and operated by the ATF. The system tracks the activity of authorized personnel based on password protected electronic access. Additionally, the NIBIN system is on a standalone network and does not interface with FBI systems, including the LIMS.

- A. For NIBIN acquisition, the electronic record generated within the NIBIN system, with the exception of training samples and performance check samples, are intended to reside in the NIBIN system indefinitely and will only be deleted if they are found to be of inferior quality or incorrectly captured. New acquisitions will replace these acquisitions.
- B. For NIBIN correlation, the correlation list will be considered part of the FBI Laboratory file records.
- C. Records for the NIBIN system will be easily associated with a case (i.e., FBI Laboratory Number, Case ID, item identifier, and Examiner name) and meet the procedures in section 2.10 of the [Operations Manual](#).
- D. For NIBIN correlations, printed or scanned correlation records will be retained in the FBI Laboratory file records.

3.4 Secondary Evidence

Secondary evidence in the FTD is defined as probative material derived from the examination of submitted evidence that includes:

- Test fired bullet, bullet jacket, cartridge case, or shotshell case
- Casts of evidentiary surface
- Test marks from tool
- Processed cloth/fabric
- Processed photographic paper
- Electronic files
- Processed bullet hole testing kit paper

3.4.1 Marking Secondary Evidence

- A. FTD secondary evidence will be labeled, at a minimum, with the following:

1. Item identifier associated with the primary item, preceded by an 'f' (meaning from), e.g., Item 4 screwdriver – test marks produced from Item 4 will be marked *f* Item 4 or *f* I4.
 2. Laboratory Number
 3. Initials
- B. For FTD secondary evidence scanned for VCM, items will be labeled, at a minimum, with the following:
1. Item identifier associated with the primary item, preceded by an 'f'
 2. Laboratory number
 3. Initials
 4. Unique identifier for test fires utilized for instrument acquisition (e.g., *f* Item 4-a, *f* Item 4a, *f* I4a, *f* Item 4b, *f* Item 4c, etc.)
- C. For secondary evidence that has insufficient surface area for this information or that resists visible markings (such as casting material), a subset of this information can be imparted to the secondary evidence if the primary container bears all of the information.
- D. Identifiers may be placed on the substrate to become a permanent part of the cast, or a paper label may be placed in the back of the cast.

3.4.2 Generating a Secondary Evidence Log

Secondary evidence will be itemized and recorded on the [FTD Secondary Evidence Log](#) (SEL). At a minimum, the SEL will include the following required fields:

- Laboratory Number
- When applicable, Item Number generated in LIMS for secondary evidence
- Item identifier associated with the primary evidentiary item, preceded by an 'f'
- Quantity of secondary evidence type derived from the primary evidentiary item
- Description of secondary evidence (e.g., cast, bullet, toolmarks)
- Indication if secondary evidence contains hazardous materials
- Page Count
- Name of preparer

4 RESULTS/CONCLUSIONS

The comparison conclusions that can be reached within the FTD are described below.

All conclusions will be recorded on the [FTD Results Worksheet](#). The record will include a listing of the items compared, the corresponding conclusion(s), date, and verification requirements.

4.1 Pattern Examination

4.1.1 Source Exclusion (i.e., Excluded, Elimination)

Source exclusion is an Examiner's conclusion that two toolmarks (firearm or non-firearm) did not originate from the same source.

- A. The basis for a source exclusion is an Examiner's opinion that two toolmarks can be differentiated by their class characteristics¹.
- B. A source exclusion is reached when there is a discernible or measurable difference in class characteristics. Class differences may result from intentional design decisions made by the manufacturer or from minor variations in tool dimensions or finishing methods that are within acceptable manufacturing tolerances for a particular tool.

4.1.2 Source Identification (i.e., Identified, Identification)

Source identification is an Examiner's conclusion that two toolmarks (firearm or non-firearm) originated from the same source. This conclusion is an Examiner's opinion that all observed class characteristics are in agreement and that the quality and quantity of corresponding individual characteristics is such that the Examiner would not expect to find that same combination of individual characteristics repeated in another source, and has found insufficient disagreement of individual characteristics to conclude they originated from different sources.

- A. The basis for a source identification conclusion is an Examiner's opinion that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks came from the same source and extremely weak support for the proposition that the two toolmarks came from different sources.
- B. A conclusion of source identification is reached when the comparison of the microscopic marks demonstrates sufficient agreement. Sufficient agreement is related to the significant duplication of random toolmarks as evidenced by the correspondence of a pattern or combination of patterns of surface contours. Agreement is significant when the agreement in the microscopic marks exceeds the best agreement demonstrated between toolmarks known to have been produced by different tools and is consistent with agreement demonstrated by toolmarks known to have been produced by the same tool.
- C. A source identification is the statement of an Examiner's opinion (an inductive inference²) that the probability that the two toolmarks were made by different sources is so small that it is negligible. A source identification is not based upon a statistically-derived or verified measurement or an actual comparison to all firearms, tools, or toolmarks in the world.

¹ The Department of Justice Uniform Language for Testimony and Reports for Forensic Firearms/Toolmarks Discipline – Pattern Match Examination allows for a source exclusion to be based upon differences in individual characteristics. A source exclusion based upon differences in individual characteristics is not approved by the FBI Laboratory Firearms/Toolmarks Discipline. This determination is based on the observations that indicate individual characteristics may not significantly duplicate or be permanent.

² Inductive reasoning (inferential reasoning): A mode or process of thinking that is part of the scientific method and complements deductive reasoning and logic. Inductive reasoning starts with a large body of evidence or data obtained by experiment or observation and extrapolates it to new situations. By the process of induction or inference, predictions about new situations are inferred or induced from the existing body of knowledge. In other words, an inference is a generalization, but one that is made in a logical and scientifically defensible manner. OXFORD DICTIONARY OF FORENSIC SCIENCE 130 (Oxford Univ. Press 2012).

4.1.3 Inconclusive

Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quantity and/or quality of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two toolmarks (firearm or non-firearm) as having originated from the same source.

- A. The basis for an inconclusive conclusion is an Examiner's opinion that there is an insufficient quantity and/or quality of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source identification; a lack of any observed microscopic similarity; or microscopic dissimilarity that is insufficient to form the conclusion of source exclusion.¹
- B. An inconclusive conclusion indicates that the microscopic marks in question may or may not have originated from the same or known source.

4.2 Fracture Examinations

4.2.1 Exclusion

Exclusion is an Examiner's conclusion that two or more fractured items do not physically fit together. When an exclusion decision is reached between fractured items from the same object, it is based upon a one-to-one comparison of those fractured items.

- A. The basis for an exclusion conclusion is an Examiner's opinion that the observed class characteristics and/or corresponding individual characteristics of the two or more fractured items provide extremely strong support for the proposition that the fractured items do not physically fit together and extremely weak or no support for the proposition that the fractured items physically fit together.

4.2.2 Fracture Fit

Fracture fit is an Examiner's conclusion that two or more fractured items were once part of the same object. This conclusion is an Examiner's opinion that all observed class characteristics are in agreement and the quality and quantity of corresponding individual characteristics of the fractures is such that the Examiner would not expect to find that same combination of individual characteristics repeated in another object and has found insufficient disagreement in individual characteristics to conclude they originated from different objects. This conclusion can only be reached when two or more fractured items physically fit together or when a comparison of the corresponding fractured surfaces reveals a fit.

- A. The basis for a fracture fit conclusion is an Examiner's opinion that the observed class characteristics and corresponding individual characteristics of the two or more fractured items provide extremely strong support for the proposition that they were once part of the same object and extremely weak support for the proposition that the fractured items originated from different objects.
- B. A fracture fit conclusion is the statement of an Examiner's opinion (an inductive inference²) that the probability that two or more fractured items were not part of

the same object is so small that it is negligible. A fracture fit conclusion is not based upon a statistically-derived or verified measurement or an actual comparison to all fractured items in the world.

4.2.3 Inconclusive

Inconclusive is an Examiner's conclusion that no determination can be reached as to whether two or more fractured items could have originated from the same object.

- C. The basis for an inconclusive conclusion is an Examiner's opinion that there is an insufficient quantity and/or quality of observed characteristics to determine whether two or more fractured items could have originated from the same object. Reasons for an inconclusive conclusion include the presence of physical or microscopic similarity that is insufficient to form the conclusion of fracture fit; a lack of any observed similarity; or physical or microscopic dissimilarity that is insufficient to form the conclusion of exclusion.¹

5 VERIFICATION

- A. Verifications involve the physical and/or virtual examinations of the items listed in the corresponding result statement.
- B. Verifications utilizing LCM will involve the physical examinations under a comparison microscope.
- C. Verifications utilizing VCM will involve the virtual observations using an approved 3D topographical instrument(s).
- D. Verifications will be recorded on the FTD Results Worksheet.
- E. The verifier is responsible for ensuring that the item designations listed on the FTD Results Worksheet are correct.
- F. If the verifier agrees with the conclusions of the original Examiner, they will record the item identifiers and the conclusions on the FTD Results Worksheet. The verifier will include the date of verification and the verifier's signature or name and initials on the FTD Results Worksheet.
- G. If the verifier and the original examiner disagree, the parties will attempt to resolve the matter and follow the process described in section 4 of the Laboratory Operations Manual.
- H. When all parties reach an agreement on the conclusion(s), it will be recorded on the FTD Results Worksheet.

5.1 Source Identification / Fracture Fit

Verifications are required for all source identifications and fracture fit conclusions.

5.2 Source Exclusion / Fracture Exclusion

Verifications are required when a minor difference in a measured class characteristic is the basis for the exclusion.

5.3 Serial Number Restoration

- A. Complete (non-transitory in nature) serial number restorations require a verification.
- B. Verification will involve physical observations and if necessary, stereoscopic examinations.
- C. The verification will be recorded on the FTD Serial Number Restoration Worksheet.

5.4 Gunshot Residue and Shot Pattern Distance Determination

- A. Distance approximations (brackets) determined for muzzle-to-garment or shot pattern distances requires a verification.
- B. Verification will involve physical observations of test exemplars and evidence.
- C. The verification will be recorded on the FTD Gunshot Residue Distance Determination Worksheet.

5.5 Blind Verification

Blind Verification (BV) is an independent examination of evidence by another authorized examiner (BV Examiner through remaining document) who is unaware of the original examiner's conclusions.

5.5.1 BV examination types

BV examinations are only performed for comparison conclusions.

5.5.2 BV criteria

A Unit Chief (UC) and/or FTD personnel who routinely handle evidence may select a submission or case record (referred to as case throughout the remaining document) for BV when it meets one of the following criteria:

- The case contains two items (one questioned and one known) for comparison.
- The case contains a limited number of items for comparison, or a subset of comparison items can be selected.
- The case contains a limited number of inconclusive results as identified by the Administrative Reviewer.

5.5.3 Managing a BV case

The UC will manage the following:

- A. Assign a BV Examiner on a rotating basis.
- B. Select cases that represent the range of possible conclusions.
- C. Generate an [FTD Blind Verification Evaluation Form](#).
- D. Evaluate the blind verification records with the FTD Technical Leader (TL).
 - 1. When the FTD TL is a BV participant, the UC will select an authorized SME to assist with the evaluation.
 - 2. Record evaluation and parties on an [FTD Blind Verification Evaluation Form](#).

- E. Maintain a list of assigned and performed BVs.
- F. Maintain completed FTD Blind Verification Evaluation Forms.
- G. Document that a total of twenty-four source conclusion blind verifications have been performed in the FTD within a calendar year.
 - 1. A source conclusion blind verification is based on a one-to-one examination of two items of evidence.
 - 2. If this total is not reached during the calendar year, the UCs will record the reason(s).
 - 3. A quarterly evaluation should take place to determine if the number of BVs are achievable for the year.

5.5.4 Performing a Blind Verification

5.5.4.1 *Original Examiner*

The original Examiner will:

- A. Conduct the necessary examinations as outlined in the FTD technical procedures.
- B. Generate the appropriate examination records.
- C. Record opinions/conclusions on the FTD Results Worksheet without obtaining a verification or consultation with other FTD personnel.
- D. Return the evidence, including secondary evidence, to the appropriate evidence storage room/location.
- E. Provide the UC with the generated examination records and results.

5.5.4.2 *BV Examiner*

The BV examiner will:

- A. Retrieve the evidence from the appropriate evidence storage room/location.
- B. Conduct the necessary examinations as outlined in the FTD technical procedures.
- C. Record opinions/conclusions on the FTD Results Worksheet and will not obtain a verification or consultation with other FTD personnel.
- D. Return the evidence to the appropriate evidence storage room/location.
- E. Provide the UC with the generated examination records and results.

5.5.5 Blind Verification records

- A. Upon successful completion of the BV, the BV Examiner's examination records will be retained with the original Examiner's examination records and serve as the verification if they reached the same comparison conclusion.
 - 1. If there is a disagreement with the conclusions between the original Examiner and BV Examiner, the parties will attempt to resolve the matter and will follow the disagreement process described in section 4 of the [Operations Manual](#).
 - 2. When all parties reach an agreement on the outcome, it will be recorded in the case notes.

- i. A record of the Examiner and BV Examiner's discussions regarding their disagreement will be recorded on the FTD Blind Verification Evaluation Form.

6 REPORTING OF RESULTS

6.1 Laboratory Report

FTD *Laboratory Reports* will utilize the report language, methods, and limitations outlined in the [FTD Report Language, Methods, and Limitations](#) document.

6.2 Intelligence, Information, and/or Investigative Leads (i3) Products

An *i3 Product* is a simplified reporting product produced in lieu of a *Laboratory Report*. These products are intended for intelligence, information, and/or investigative leads only and are not intended for adjudication purposes. *i3 Products* generated in the FTD will contain the required elements described in section 3 of the [Laboratory Operations Manual](#) and be supported through examinations utilizing [FTD Technical Procedures](#).

6.2.1 Criteria for an i3 Product

An *i3 Product* can be utilized in the FTD when the contributor is not requesting information for the purpose of a legal proceeding.

6.2.2 Recording an i3 Product

- A. The summary of results will be recorded on the FTD i3 Product Form.
- B. Technical records that support the summary of results will be understandable to a reviewer possessing the relevant knowledge, skills, and abilities and contain sufficient detail to evaluate what was done and interpret the data.
- C. Technical records for i3 Products must be sufficient in detail that in the event it is necessary a Laboratory Report can be issued and/or testimony provided.
 1. All requirements described in section 2.10 of the [Laboratory Operations Manual](#) will be followed.

6.2.3 Reviewing an i3 product

- A. All *i3 Products* will be reviewed by authorized personnel prior to their release.
- B. A review of an *i3 Product* will evaluate the case records and other supporting information utilized to form the conclusions contained in the product. This review will be recorded and consists of determining whether the appropriate assessments have been performed, and whether the conclusions are consistent with the recorded data and within the scope of the discipline.
- C. The review will be recorded in the LIMS.
- D. If the *i3 Product* is classified, then the reviewer(s) must be an approver in Sentinel.
- E. All reviews will be serialized in Sentinel.

6.2.4 Tracking and maintaining an i3 product

- A. All i3 Products and their associated records will be maintained within the Case ID Number that is established for the submission and serialized in Sentinel.
- B. All i3 Products will be tracked within the established discipline Case ID.

7 REVIEWS

7.1 Technical and Administrative

- A. For disagreement resolution, the reviewer(s) and examiner will follow the process in section 4 of the Laboratory Operations Manual.
- B. Reviews (i.e., blind verification, technical, administrative) will be recorded in the LIMS.
- C. Reviewers may use the FTD Quick Reference for Performing Reviews.
- D. For Legacy cases, the FTD Quick Reference for Performing Reviews will include the reviewer's signature and date and be retained in the case file records.
- E. Comments and feedback will be recorded in the feedback section of the review details in the LIMS.

7.2 Field Examinations

- A. For trajectory determination, a Laboratory Report may be prepared and will be technically and administratively reviewed.
- B. If circumstances require an FD-302 or other forms of communication be drafted in the field or prior to the issuance of a Laboratory Report or i3 Product, the procedures for expedited results, section 3.3, will be followed in the Operations Manual.
- C. The contents of such communications will set forth the activities of the Laboratory Shooting Reconstruction Team and are intended for investigative guidance purposes only.
- D. These communications will not contain technical opinions.

8 REFERENCES

Association of Firearm and Tool Mark Examiners (AFTE) Journals, July 1992, Vol. 24, No. 3 and Fall 2011, Vol. 43, No. 4.

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9 REVISION HISTORY

Revision	Issue Date	Changes
00	02/18/2022	Drafted with new template requirements. Merged sections from FTD-104-07, FTD-105-01, FTD-110-08, and FTD-113-01. Transferred sections were updated to align with current QAM and LOM requirements for level 2 documents and remove duplicative requirements between the various documents.